Determinants of Chilean youth voter registration: Evidence for the Bio Bio region

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Abstract

Voter registration among youth is a worldwide phenomenon that exhibits a notorious decline over the last two decades. In that regard, this paper presents evidence related to the variables that determine the decision of voter registration among young population from the Biobio region, the second most populated Chilean region. A random-effects Tobit model is estimated using electoral and socioeconomic data from 54 municipalities and 10 planning territories of the Biobio region. The results indicate that the main determinants of voter registration among youth are real income, civic engagement, poverty rate, and ethnic population. In particular, the positive effect of civic-participation rate is higher among male population. The evidence further suggests the existence of a class-biased electorate and an increasing electoral apathy among indigenous people in the Biobio region. Finally, latest elections seemed to encourage a greater political involvement among youth, which outlines a promising scenario for Chilean democracy's legitimacy.

Keywords: compulsory voting, voting behavior, Latin America, Chile

JEL Codes: C23, D72, O10, R10

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1 Introduction.

Around the world, the evolution of youth vote has shown a decline in its participation rate, particularly in economies with a voluntary voting rule. In France, the proportion of non-registrants was 11.3% in 1983 against 10% in 2001. Nevertheless, the French abstention-rate rose from 21.6% to 32.7% over the same period (Pan Ke Shon, 2004).

In some Scandinavian countries, such as Finland or Denmark, turnout is higher in the youngest or first time voters. For instance, in the Danish municipal election of 2009 turnout was 57% among 18-year-olds, while this figure was 42.6% for 21-years-old population (Wass, 2007; Bhatti et al., 2012).

In the United States, many politicians and scholars have shown concern about low turnout levels, which has motivated some government efforts to increase participation rate, e.g., the National voter registration Act of 1993. In fact, in the election of November 2010 just 21% of citizens aged 18 to 24 attended to polling stations (Brandon, 2012).

On the other hand, in countries with mandatory voting laws, such as Australia, Singapore, or Brazil, voters have to pay an expensive fine if they do not exercise their civic duty, a policy which has increased voter turnout (Krasa & Polborn, 2009). In Chile, the share of young population (i.e., 18-29 years old) in the electoral register has declined from 36% in 1988 to 9.71% in 2005. Moreover, voter registration among youth has experienced a clear reduction from 90.7% in 1988 to 26.4% in 2005 (Toro, 2007).

The Biobio region, the most populated Chilean region after Metropolitana region, suffers a similar phenomenon. In fact, the enrollment rate among young population has fallen from 49.9% in 2000 to 20.7% in 2011, a phenomenon that has clearly affected more men than women. The registration rate for the former has lost 32.1 percentage points, while the latter has lost 26.5 percentage points in the same period (see Figure 1).

In 2011, the lowest registration-rate for youth vote can be found in those planning territories[1] linked to urban centers, such as Pencopolitano (20.4%), Reconversión (19.9%), Chillán (19.3%), and Biobío Centro (14.6%) (see Figure 2).

Since 2011 Chilean youth has been a key starring in the social movement that intends to lead and establish a reform process in the Chilean education system. On the other hand, National Congress of Chile has finally approved, after a long discussion process, a constitutional reform that establish a new voting rule: automatic enrollment and voluntary voting. These facts motivate the interest of this paper to focus on the voter registration phenomenon in the Chilean young population. Therefore, this research aims to generate evidence regarding

[1] The complete list of municipalities and planning territories of the Biobio region can be found in Appendix A.

economic and social factors that determine the decision of voter registration among Chilean youth, in particular, the inhabitants of the Biobio region.

The rest of the paper is organized as follows. Next section presents the methodology used in the electoral study. Third section discusses the main findings, while a fourth section concludes.

2 Material and methods.

2.1 Modeling the decision of voter registration.

The literature about voting rationality and voter turnout is based on the pioneer work of Anthony Downs (1957) and Gordon Tullock in 1967 (cited by Barzel & Silberberg, 1973), but it was mainly developed in the 1970s. During this decade, the efforts were focused not only on giving a theoretical framework to these political concepts (Frey, 1971; Stigler, 1972; Barzel & Silberberg, 1973; Tollison & Willett, 1973; Ferejohn & Fiorina, 1974; May & Martin, 1975), but also on identifying the determinants of voter participation as a social phenomenom (Silberman & Durden, 1975; Tollison et al., 1975; Settle & Abrams, 1976). On this basis, the following model aims to give a microeconomic foundation to the decision of voter registration. The model considers a compulsory voting rule, such as the one prevailing in Chile, a Latin American democracy.

Suppose that a democratic society allows voluntary voter registration but mandatory voting. This society is populated by n citizens that have preferences over a consumption good, x_i, which price is given by p_x. In addition, the available time can be allocated as follows, each citizen can allocate a proportion h_i to work in the labor market and a proportion l_i to enjoy leisure. Thus, each individual earns a nominal wage rate, w, after working a proportion h_i of its available time. Leisure time is allocated to costless activities that are linked to civic participation.

Moreover, each citizen values the democratic institutions or democratic principles, d, that prevail in the society. In this context, each individual must decide whether or not to be part of civic life through voter enrollment, which is represented by the variable r_i. If the individual decides to be enrolled in the voter register (i.e., $r_i = 1$), then he (or she) contributes to strengthening the democratic institutions. However, this decision implies a nominal cost c_r, which summarizes all the costs related to mandatory voting, such as transportation costs or a fine for not attending to the polling stations. Conversely, if the individual decides not to be enrolled, then $r_i = 0$.

Therefore, each citizen must solve the following problem:

$$\max_{\{x,l,r\}} u_i(x_i, l_i, d) \qquad \text{subject to:} \tag{1}$$

$$p_x x_i + c_r r_i \leq h_i w \tag{2}$$

$$l_i + h_i = 1 \tag{3}$$

$$x_i \geq 0; l_i, h_i \in [0, 1] \tag{4}$$

Where $u_i(\cdot)$ is the utility function for individual i, the equation (2) represents the budget constraint that faces every individual, and the equation (3) is the available time constraint. In addition, it is possible to express the budget constraint in real terms as follows:

$$x_i + \delta r_i \leq h_i \omega \tag{5}$$

Where $\delta = c_r/p_x$ is the real cost for being enrolled in the voter register, and $\omega = w/p_x$ is the real wage.

Moreover, the electoral roll, R, is composed by the sum of those individuals that decided to be enrolled on, i.e., for whom $r_i = 1$. Also, it is assumed that democratic institutions, d, is a function of the voter register; that is, $d = f(R)$, where $f(\cdot)$ is a continuous, increasing, and at least twice differentiable function. Therefore, if the aim is to maximize the common good, then the problem that has to be solved looks as follows:

$$\max_{\{x,l,r,d\}} \sum_{i=1}^{n} \alpha_i * u_i(x_i, l_i, d) \qquad \text{s.t.:} \tag{6}$$

$$\sum_{i=1}^{n} x_i + \sum_{i=1}^{n} \delta r_i \leq \sum_{i=1}^{n} h_i \omega \tag{7}$$

$$l_i + h_i = 1 \tag{8}$$

$$\sum_{i=1}^{n} r_i = R \tag{9}$$

$$d \leq f(R) \tag{10}$$

$$x_i \geq 0; d \geq 0; l_i, h_i \in [0, 1] \tag{11}$$

Where α_i represents the relative weight of each individual i in the society. Therefore, $\sum_{i=1}^{n} \alpha_i = 1$.

If λ and μ are the Lagrange multipliers associated to constraints (7) and (10), respectively, then it is feasible to obtain the following necessary first order conditions:

$$\frac{\partial}{\partial x_i} \rightarrow \lambda = \alpha_i \frac{\partial u_i}{\partial x_i} \tag{12}$$

$$(13) \quad \frac{\partial}{\partial l_i} \rightarrow \lambda = \frac{\alpha_i}{\omega} \frac{\partial u_i}{\partial l_i}$$

$$(14) \quad \frac{\partial}{\partial d} \quad \rightarrow \quad \mu = \sum_{i=1}^{n} \alpha_i \frac{\partial u_i}{\partial d}$$

$$(15) \quad \frac{\partial}{\partial r_i} \quad \rightarrow \quad \delta\lambda = \mu f'(R)$$

After combining the above relationships, it is possible to obtain the following optimality condition:

$$(16) \quad f'(R) = \left(\frac{\delta}{\omega}\right) \sum_{i=1}^{n} \frac{\partial u_i / \partial l_i}{\partial u_i / \partial d} = \delta \sum_{i=1}^{n} \frac{\partial u_i / \partial x_i}{\partial u_i / \partial d}$$

The optimality condition yields the optimal values for $x_i^\star$, $l_i^\star$, $h_i^\star$ $r_i^\star$, $d^\star$, and $R^\star$, from which can be defined the following concepts. The voter registration rate, ν, is given by:

$$(17) \quad \nu = \frac{1}{n} \sum_{i=1}^{n} r_i^\star$$

The civic participation rate, κ, is defined as follows:

$$(18) \quad \kappa = \frac{1}{n} \sum_{i=1}^{n} l_i^\star$$

Now, suppose that the utility function is additively separable in its three arguments and its functional form is the following:

$$(19) \quad u_i(x_i, l_i, d) = \phi_1 \ln x_i + \phi_2 \ln l_i + \phi_3 \ln d$$

In addition, suppose that the democracy function, $f(R)$, has the following functional form:

$$(20) \quad d = f(R) = \frac{R^2}{n}$$

Therefore, the optimality condition (16) implies the following:

$$\frac{2R^\star}{n} = \left(\frac{\delta}{\omega}\right)\sum_{i=1}^{n}\frac{\phi_2}{l_i^\star}\frac{d^\star}{\phi_3} \quad (21)$$

If we rearrange condition (21), then it is possible to arrive the following expression:

$$R^\star = \sum_{i=1}^{n} r_i^\star = \left(\frac{2\omega\phi_3}{\delta\phi_2}\right)\sum_{i=1}^{n} l_i^\star \quad (22)$$

If we divide both sides of expression (22) by the population, n, then the optimal voter registration rate, $\nu^\star$, is obtained:

$$\nu^\star = \left(\frac{2\omega\phi_3}{\delta\phi_2}\right)\kappa^\star \quad (23)$$

Where $\nu^\star = \frac{R^\star}{n}$ and $\kappa^\star = \frac{1}{n}\sum_{i=1}^{n} l_i^\star$.

If the equation (23) is log-linearized, then it can be obtained the following expression:

$$\ln\nu^\star = \ln\left(\frac{2\phi_3}{\phi_2}\right) + \ln(\omega) + \ln(\kappa^\star) - \ln(\delta) \quad (24)$$

Since $\nu^\star$ and $\kappa^\star$ belong to the interval $[0, 1]$, then an empirical relationship, which is coherent with equation (24), is given by:

$$\nu = \alpha_0 + \alpha_1\ln(\omega) + \alpha_2\kappa + \alpha_3\ln(\delta) + \eta \quad (25)$$

Where η represents the estimation error.

2.2 The empirical model.

The empirical study was focused on the Chilean Biobio region and considered 54 municipalities and 10 planning territories. The data set was collected from Chilean Electoral Service (SERVEL), National Institute of Statistics (INE), and National Socioeconomic Characterization survey (CASEN)[2]. All these data sources enabled to build a four-period panel for the years 2000, 2003, 2006, and 2009.

[2]The CASEN survey has been applied since 1985 by Ministry of Social Development, former Ministry of Planning and known as MIDEPLAN, in order to capture information about the following modules: residents, education, labor market, income, health, and housing. Also, it includes some emergent topics, such as wealth and ICT, disability, poverty programs, ethnicity, migration, autobiography, and civic participation.

The empirical methodology was based on the model derived in the above subsection, which is coherent with the empirical model proposed by Silberman & Durden (1975), whom argued a linear relationship between voter participation and several economic and social variables.

Since there is not a valid measurement or proxy variable for the real cost of being enrolled (δ), then this variable has been omitted. Thus, the model was estimated using the panel data approach in order to obtain robust results (see Wooldridge, 2002). In addition, two control variables were added: the ethnicity ratio (*ethnic*) and a dummy variable (*ballot*) which takes value of one if an election was held at time t and zero otherwise.

Furthermore, since voter registration rate is a truncated variable in the interval [0,1] or [0,100], then the model was estimated using the corner solution approach[3] in the form of a two-limit random effects Tobit (2LRET) model, which implies the following empirical model:

$$\nu^{\star}_{i,t} = \begin{cases} 0 & \text{If } r_j = 0 \quad \forall j = 1, \ldots, n \\ youthvote_{it} & \text{If } r_j \neq 0 \text{ for some } j \\ 1 & \text{If } r_j = 1 \quad \forall j = 1, \ldots, n \end{cases} \tag{26}$$

Where $\nu^{\star}_{it}$ is the youth vote rate in municipality (or planning territory) i at time t, r_j the optimal voter registration decision of a citizen j that belongs to a municipality (or planning territory) populated by n individuals, and $youthvote_{it}$ is given by:

$$youthvote_{it} = \beta_1 + \beta_2 lnwage_{i,t} + \beta_3 particip_{i,t} + \beta_4 ethnic_{i,t} + \beta_5 ballot_{i,t} + c_i + \eta_{i,t} \tag{27}$$

On the other hand, the model represented by Equation (27) was estimated again after replacing variable *lnwage* by the variable *poverty*, because a fraction of youth is a full-time higher education student, still live with their parents, and are not part of the labor market. Therefore, the poverty-rate variant of the model is given by:

$$youthvote_{i,t} = \beta_1 + \beta_2 poverty_{i,t} + \beta_3 particip_{i,t} + \beta_4 ethnic_{i,t} + \beta_5 ballot_{i,t} + c_i + \varepsilon_{i,t} \tag{28}$$

The above variables are described as follows:

youthvote: ratio between youth enrolled in the electoral register and youth population (i.e., 18 to 29-year-olds). In addition, this indicator was computed for the male and female electorates using available data at SERVEL.

[3]See Wooldridge (2002, Ch. 16) for further details.

lnwage: the natural logarithm of average real income in Chilean pesos of 2009. It was computed using the variable *yautaj* from the CASEN survey.

poverty: poverty rate for young population.

ethnic: indigenous youth to youth population ratio. The ethnic groups recognized in Chile are Aymara, Rapa-nui, Quechua, Mapuche, Atacameño, Coya, Kawaskar, Yagán, and Diaguita.

particip: civic participation rate for youth, it includes those activities listed in questions P18, R18, and T18A, that are included in the CASEN 2000, 2003, and 2009 surveys, respectively. Since this question was excluded from CASEN 2006 survey, then the gap for 2006 was filled by its 2003-2009 average.[4]

ballot: dummy variable, which takes value of one if an election (e.g., presidential, senatorial and deputies, or mayor) was held at time t, and zero otherwise.

Finally, η and ε represent the idiosyncratic error for both models. Next section develops the main findings obtained from the model estimates.

3 Main findings and discussion.

The model was estimated for the Biobio region considering a municipal panel and a planning territory panel. In that regard, the municipality panel included 52 out of 54 municipalities, because Hualpén and Alto Bío Bío were created on March 13 and April 22 in 2004, respectively. Therefore, these counties were not part of the CASEN survey until its 2006 round. However, the planning territory panel was not affected after excluding both municipalities, because they were originally part of Talcahuano and Santa Bárbara, respectively. Main findings are discussed below.

3.1 Results from the average income variant.

The results from the 2LRET estimation under the average income variant are compiled in Tables 1 and 2. The columns one, two, and three from these tables show the 2LRET results for municipal electorates, whereas columns four, five, and six the territorial estimates.

At the municipal level, the results indicate that all variables are individually and jointly significant to explain the voter-registration rate among youth. In particular, civic participation rate (*particip*) is significant at the 1% level, which positively affects the registration

[4]See Ministerio de Planificacion (2000, 2003, 2006, 2009).

rate in the Biobio region. This indicates that young people committed with several activities or instances of civic participation are less inclined to exclude themselves from democratic institutions. On the contrary, the effect of real income (*lnwage*) is negative and significant, which is consistent with the "opportunity cost of time" argument highlighted by Settle & Abrams (1976).

The evidence further suggests differences between men and women inside this age group. In fact, the positive effect of social capital (*particip*) and the negative effect of ethnicity seem to be larger for male youth in the Biobio region (columns 2 and 3, Tables 1 and 2).

At the territorial level, the estimates indicate that civic participation rate is still the main determinant of youth voter registration in the Biobio region, which impact is higher than that estimated at municipality level and statistically significant at 1%.

By gender, income effect is still negative for the full, male, and female electorates (columns 4-6, Tables 1 and 2). The evidence also indicates that civic participation rate (*particip*) has no effect on female registration rate.

Finally, an impending election, measured by the dummy variable *ballot*, increases electoral enrollment in about 14 percentage points during the period 2000-2009.

3.2 Results from the poverty rate variant.

Main findings from the poverty rate variant are summarize in Tables 3 and 4. The columns one through three from these tables show the 2LRET results for municipal electorates, whereas columns four through six the territorial estimates.

At the municipal level, the estimates confirm previous findings. That is, all variables are individually and jointly significant to explain the voter-registration rate among youth. In particular, the voter registration rate is positively affected by the civic participation rate (*particip*), which coefficient is larger than that estimated in the average income variant.

Regarding the poverty rate, these findings suggest the existence of a class-biased electorate in the Biobio region. In fact, the evidence shows that counties that exhibit lower levels of social inclusion tend to participate more in politics, which is in line with the negative income-effect previously reported. Moreover, the poverty effect is larger among young women.

At the territorial level, the estimates confirm that civic participation rate is a transversal determinant of youth voter registration in the Biobio region. That is, the estimated parameters for the variable *particip* are statistically significant at the 10% level and their highest magnitude can be observed in the full and male panels.

On the other hand, the results suggest that Biobio's ethnic population is reluctant to be

enrolled in the electoral register, especially female population (column 6, Table 4).

By gender, the main determinants of female voter registration are the civic participation (*particip*), ethnicity rate (*ethnic*), and an impending election (*ballot*).

Finally, the variable *ballot* seems to have a significant impact on the phenomenon under study, which positive effect is smaller than previous estimates from the average-income variant.

4 Concluding remarks.

Youth apathy toward participating in a democratic system is a local and global concern that deserves the attention of authorities, public, and academic community. In that regard, the current empirical research aimed to identify the structural variables that influence the voter registration rate of Chilean youth, in particular, the inhabitants of the Biobio region. Thus, from the application of the proposed methodological approach, it is possible to arrive to the following conclusions.

For the municipalities of the Biobio region, the estimates suggest that the main determinants of voter registration among youth are real income, civic engagement, poverty rate, and ethnic population. The negative effects related to real income and ethnic population are further consistent with classical literature on voting behavior (Silberman & Durden, 1975; Settle & Abrams, 1976), suggesting the existence of a class-biased electorate and an increasing electoral apathy among indigenous people in the Biobio region.

For the planning territories, the results are similar to those highlighted above. However, after including the poverty rate in the model, the estimated effects of civic participation rate are higher than those originally reported, especially among male population.

On the other hand, there is strong evidence to claim that an electoral process has increased the rate of voter registration during the last decade within the Biobio region. This finding envisages a promising scenario for Chilean democracy's legitimacy, because latest elections (i.e., mayor, deputies and senators, or presidential) seemed to encourage a greater political involvement among young population, expressing their will regarding the elected authorities and the political system that prevails in Chile.

In addition, there are some potential limitations. First, there are not available yearly data for all the economic and social variables, despite it is possible to find them for electoral variables. Second, the civic participation module was eliminated from CASEN 2006 survey (Ministerio de Planificacion, 2006). Finally, it is difficult to gather additional disaggregated information for all the municipalities in order to add new control variables to the empirical model. Despite the above research limitations, and given the scarce Chilean literature, this

is a first attempt to address the youth vote phenomenon from a regional perspective that could be a starting point for future research.

As a final thought, any private initiative or government policy aimed to increase the political involvement among Chilean youth (e.g., encouraging several instances of civic participation) will strengthen the democratic institutions, civic traditions, and social capital in Chile. Undoubtedly, this will determine the success of the Act 20,568 that instituted a voluntary voting rule in the Chilean democracy.

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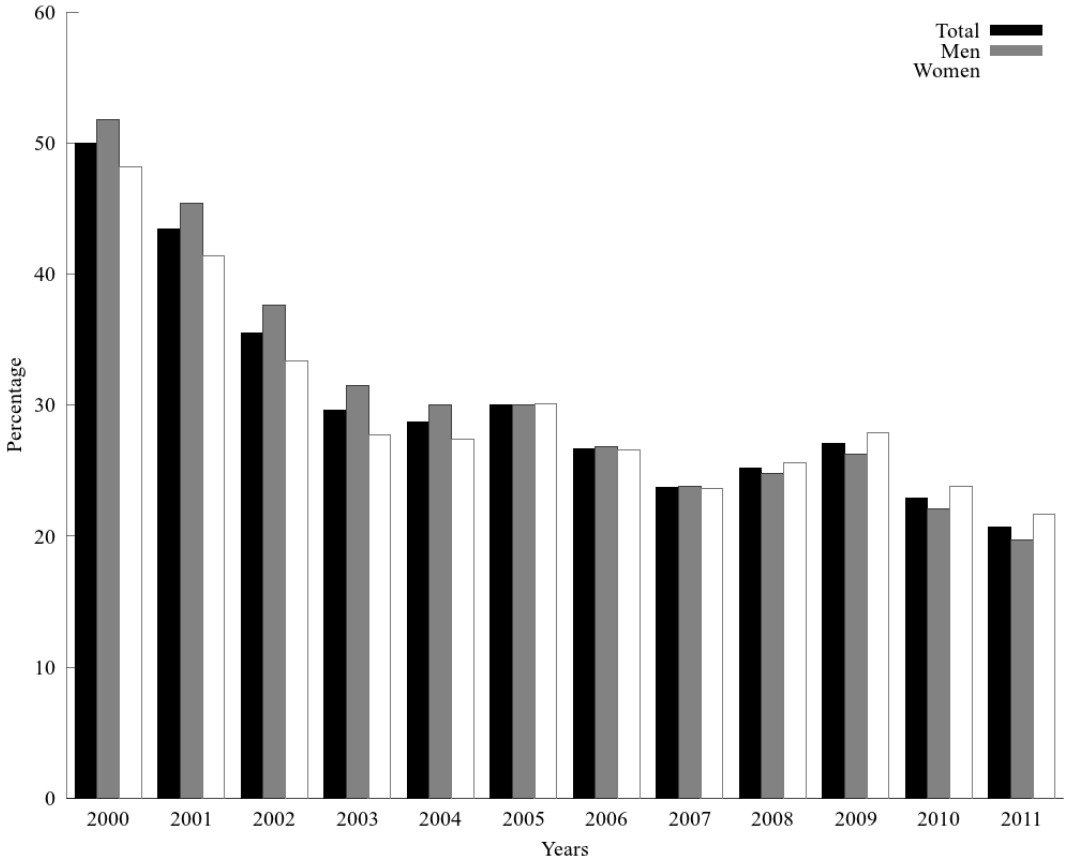
Appendix A List of municipalities classified by planning territory, Biobio region, Chile.

Planning territories	Municipalities	Planning territories	Municipalities
Valle del Itata	Cobquecura	Arauco	Arauco
	Coelemu		Cañete
	Ninhue		Contulmo
	Portezuelo		Curanilahue
	Quillón		Lebu
	Quirihue		Los Álamos
	Ránquil		Tirúa
	San Nicolás		
	Treguaco	Chillán	Chillán
Pencopolitano	Chiguayante	Laja-Diguillín	Bulnes
	Concepción		Chillan Viejo
	Hualpén		El Carmen
	San Pedro de la Paz		Pemuco
	Talcahuano		Pinto
	Tomé		San Ignacio
	Penco		Yungay
Secano Interior (AMDEL)	Cabrero	Bío Bío Centro	Laja
	Florida		Los Ángeles
	Hualqui		Nacimiento
	San Rosendo		
	Santa Juana	Bío Bío Cordillera	Antuco
	Yumbel		Alto Bío Bío
			Mulchén
Reconversión	Coronel		Negrete
	Lota		Quilaco
			Quilleco
Punilla	Coihueco		Santa Bárbara
	Ñiquen		Tucapel
	San Carlos		
	San Fabián		

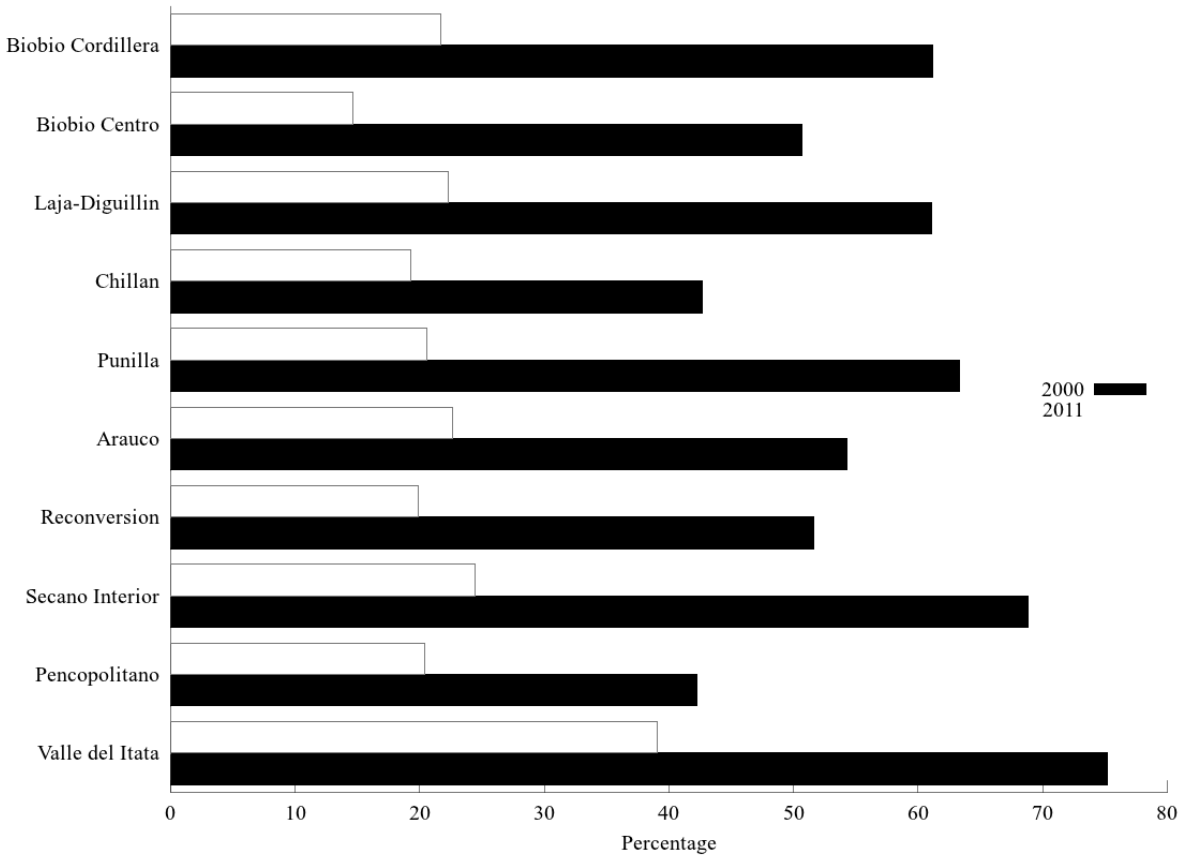
Source: Unidad de Gestión de Información Territorial (UGIT), Regional Government of Biobio

Figure 1: Voter registration-rate for young population (ages 18 to 29), Biobio region, period 2000-2011.



Source: Electoral Service and National Institute of Statistics, Chile

Figure 2: Voter registration-rate for young population (ages 18 to 29), planning territories of Biobio region, years 2000 and 2011.



Source: Electoral Service and National Institute of Statistics, Chile

Table 1: 2LRET results for municipalities and planning territories under the average income variant

	Municipal electorates			Territorial electorates		
	Full	Male	Female	Full	Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: *youthvote*						
constant	2.5347***	2.3283***	2.2415***	4.3171***	3.5646*	2.8348**
	(0.7416)	(0.6174)	(0.3427)	(1.2277)	(1.6971)	(0.9495)
lnwage	-0.1893***	-0.1739***	-0.1618***	-0.3394***	-0.2773*	-0.2171**
	(0.0585)	(0.0493)	(0.0277)	(0.0818)	(0.1325)	(0.0756)
particip	0.4973***	0.5365***	0.3116**	0.5482**	0.5671*	0.4324
	(0.1616)	(0.1136)	(0.1414)	(0.1810)	(0.3005)	(0.2704)
ethnic	-0.4402***	-0.4399***	-0.2854**	-0.9324***	-0.9049	-0.6021*
	(0.1439)	(0.1654)	(0.1179)	(0.2813)	(0.6407)	(0.2757)
ballot	0.1554***	0.1617***	0.1463***	0.1467***	0.1407***	0.1400***
	(0.0119)	(0.0140)	(0.0153)	(0.0153)	(0.0263)	(0.0162)
No. of obs.	208	208	208	40	40	40
No. of groups	52	52	52	10	10	10
Left-censored obs.	0	0	0	0	0	0
Right-censored obs.	2	4	3	0	0	0
F statistic	59.78	45.28	32.53	37.86	12.06	40.29

Note: Standard jackknife errors in parentheses. * 10% significance; ** 5% significance, *** 1% significance.

Table 2: Conditional marginal effects for municipalities and planning territories under the average income variant

	Municipal electorates			Territorial electorates		
	Full	Male	Female	Full	Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)
lnwage	-0.1859***	-0.1678***	-0.1576***	-0.3394***	-0.2772**	-0.2170***
	(0.0583)	(0.0486)	(0.0274)	(0.0846)	(0.1331)	(0.0772)
	[12.075]	[12.141]	[11.911]	[12.163]	[12.233]	[12.026]
particip	0.4882***	0.5177***	0.3036**	0.5482***	0.5670*	0.4323
	(0.1576)	(0.1083)	(0.1378)	(0.1813)	(0.3004)	(0.2683)
	[0.286]	[0.319]	[0.254]	[0.263]	[0.294]	[0.231]
ethnic	-0.4322***	-0.4245***	-0.2781**	-0.9324***	-0.9047	-0.6019**
	(0.1411)	(0.1587)	(0.1155)	(0.2674)	(0.6431)	(0.2743)
	[0.042]	[0.040]	[0.044]	[0.033]	[0.035]	[0.031]
ballot	0.1518***	0.1550***	0.1418***	0.1467***	0.1406***	0.1399***
	(0.0115)	(0.0127)	(0.0147)	(0.0148)	(0.0262)	(0.0161)
	[1]	[1]	[1]	[1]	[1]	[1]

Note: Standard error in parentheses and mean values in brackets. * 10% significance, ** 5% significance, *** 1% significance.

Table 3: 2LRET results for municipalities and planning territories under the poverty rate variant

	Municipal electorates			Territorial electorates		
	Full	Male	Female	Full	Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: *youthvote*						
constant	0.1167***	0.0995**	0.1778***	0.0667	0.0145	0.0635
	(0.0363)	(0.0448)	(0.0391)	(0.0740)	(0.0596)	(0.0746)
poverty	0.4013***	0.3353**	0.4391***	0.3360	0.6034	0.5829
	(0.0979)	(0.1359)	(0.0974)	(0.3068)	(0.4382)	(0.3897)
particip	0.5923***	0.6481***	0.3676***	0.7763***	0.6726*	0.4999*
	(0.1162)	(0.1008)	(0.1325)	(0.1796)	(0.3480)	(0.2573)
ethnic	-0.4362**	-0.4119**	-0.2863*	-1.2238**	-1.0388	-0.7531
	(0.1796)	(0.1828)	(0.1463)	(0.4159)	(0.6874)	(0.4264)
ballot	0.1416***	0.1559***	0.1256***	0.1162***	0.1198***	0.1055***
	(0.0119)	(0.0151)	(0.0130)	(0.0172)	(0.0304)	(0.0118)
No. of obs.	208	208	208	40	40	40
No. of groups	52	52	52	10	10	10
Left-censored obs.	0	0	0	0	0	0
Right-censored obs.	2	4	3	0	0	0
F statistic	69.52	39.60	43.57	31.81	20.46	54.72

Note: Standard jackknife errors in parentheses. * 10% significance; ** 5% significance, *** 1% significance.

Table 4: Conditional marginal effects for municipalities and planning territories under the poverty rate variant

	Municipal electorates			Territorial electorates		
	Full	Male	Female	Full	Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)
poverty	0.3923***	0.3224**	0.4253***	0.3358	0.6028	0.5824
	(0.0977)	(0.1336)	(0.0957)	(0.3099)	(0.4402)	(0.3959)
	[0.277]	[0.251]	[0.303]	[0.261]	[0.235]	[0.287]
particip	0.5789***	0.6231***	0.3560***	0.7759***	0.6719*	0.4996**
	(0.1131)	(0.0953)	(0.1281)	(0.1758)	(0.3453)	(0.2509)
	[0.286]	[0.319]	[0.254]	[0.263]	[0.294]	[0.231]
ethnic	-0.4264**	-0.3961**	-0.2773*	-1.2231***	-1.0378	-0.7526*
	(0.1755)	(0.1753)	(0.1422)	(0.4037)	(0.6817)	(0.4223)
	[0.042]	[0.040]	[0.044]	[0.033]	[0.035]	[0.031]
ballot	0.1378***	0.1488***	0.1211***	0.1161***	0.1196***	0.1053***
	(0.0114)	(0.0134)	(0.0123)	(0.0171)	(0.0303)	(0.0117)
	[1]	[1]	[1]	[1]	[1]	[1]

Note: Standard error in parentheses and mean values in brackets. * 10% significance, ** 5% significance, *** 1% significance.